A Case-Control Study of Total Hip Arthroplasty After Failed Proximal Femoral Fracture Fixation

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Background/Purpose: Fractures of the proximal femur are becoming more prevalent as the population ages. Femoral neck and intertrochanteric fractures account for most proximal femoral fractures and although the initial treatment of these two injuries may differ, the salvage procedure for failed internal fixation is often a conversion to total hip arthroplasty (THA). The use of THA for failed internal fixation of hip fractures can restore function and reduce the need for subsequent reoperations; however, the distorted bony anatomy, scar tissue, and potential hardware around the hip result in a more challenging procedure in this subset of patients. The aim of this study was to investigate the clinical and radiographic outcomes in patients who have undergone THA after a failed fixation of a proximal femoral fracture.

Methods: This retrospective case-control study compared findings of patients who underwent THA after failed open reduction and internal fixation (ORIF) of a proximal femoral fracture to a primary THA for nontraumatic osteoarthritis. From 2004 to 2014, 40 patients received a THA after failed internal fixation of a previous proximal femur fracture. The matched cohort of patients was matched for date of operation, age, gender, and type of implant to control for their confounding effects on outcomes. The outcome measurements included length of surgery, drop in hemoglobin, length of hospital stay, blood transfusion rates, medical complications, dislocations, revision procedures, and clinical outcome scores at latest follow-up. Statistical analysis was performed using the Student t test and vhi-squared test with significance set at a P value <0.05.

Results: The cohort of patients with a salvage THA included 18 male and 22 female patients with a mean age of 73 years (range, 28-96 years) and mean follow-up of 3.1 years (range, 1-8.3). Those with failed internal fixation included 12 intertrochanteric fractures (10 DHS [dynamic hip screw], 1 IM [intramedullary] nail, 1 blade plate) and 28 femoral neck fractures (21 cannulated screws, 6 DHS, 1 blade plate). The mean time between the internal fixation of the fracture and the THA was 2.1 years (standard deviation [SD], 2.7 years) for intertrochanteric fractures and 8.5 years (SD, 13.8 years) for femoral neck fractures ($P = 0.03$). There was no difference in the time to THA between DHS and cannulated screws for femoral neck fractures. The failed fixation group had longer procedures with a mean operative time of 99.49 ± 11.80 minutes compared to 77.20 ± 7.53 minutes for the primary THA group ($P < 0.05$). The drop in hemoglobin from preoperative to postoperative day three was greater in the failed fixation group with a mean drop of 53.52 ± 6.08 g/L compared to 43.06 ± 4.68 g/L in the primary THA group ($P < 0.05$). The transfusion rate was 50% in the failed fixation group compared to 25% in the primary THA group ($P < 0.05$). There was one THA revision in the failed fixation group for infection and Vancouver B2 periprosthetic femur fracture. Additionally, there was also one case of dislocation in the failed fixation group that was treated by closed reduction and did not require revision. There were no revisions or dislocations in the primary THA group. Length of admission and medical complications

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were not significantly different between the groups. The functional outcome was assessed using a standardized hip score and was found not statistically different between the groups at final follow-up (P = 0.41).

Conclusion: Conversion to THA after failed fixation of proximal femur fractures results in comparable clinical results to primary THA with an increased operative time, blood loss, and blood transfusion rate. The findings from this study support that the initial management of proximal femoral fractures by internal fixation does not negatively affect the outcomes of a salvage THA.